

WE CLAIM:

1. A system for a lower extremity prosthesis comprising:
a longitudinally extending foot having a forefoot portion at one end, a hindfoot portion at an opposite end and a midfoot portion extending between said forefoot and hindfoot portions;
an ankle secured to the foot;
an upstanding shank extending upward from the ankle;
wherein the ankle and shank are formed by a resilient member which extends upward from the foot by way of an anterior facing convexly curved portion of the member, and wherein the member is secured to the foot by way of a coupling element which is monolithically formed with the forefoot portion of the foot.
2. The system according to claim 1, wherein the coupling element extends posteriorly from the forefoot portion as a cantilever over the midfoot portion and part of the hindfoot portion of the foot.
3. The system according to claim 2, wherein the hindfoot portion and the midfoot portion of the foot are monolithically formed and connected to the monolithically formed forefoot portion and coupling element.
4. The system according to claim 1, wherein the lower end of the resilient member is reversely curved.
5. The system according to claim 4, wherein the coupling element houses the reversely curved lower end of the resilient member.
6. The system according to claim 4, wherein the reversely curved lower end of the resilient member is in the form of a spiral.
7. The system according to claim 6, wherein a radially inner end of the spiral of the resilient member is fastened to the coupling element.

8. The system according to claim 1, wherein the coupling element includes a stop to limit dorsiflexion of the resilient member.

9. The system according to claim 1, further comprising a cosmetic covering in the shape of a human foot and lower leg, the cosmetic covering being located over the foot, ankle and at least the lower end of the shank with the shank extending upward from the ankle within the lower leg covering.

10. The system according to claim 1, further comprising a posterior calf device on the prosthesis to store energy during force loading of the prosthesis and return the stored energy during force unloading to increase the kinetic power generated for propulsive force by the prosthesis in gait.

11. The system according to claim 10, wherein the device includes at least one elongated member extending between the upper portion of the shank and a lower portion of the prosthesis, and at least one spring which is resiliently biased by the at least one elongated member in response to anterior movement of the upper end of the shank for storing energy.

12. The system according to claim 11, wherein the at least one spring includes a coiled spring with a free end connected to the elongated member, the coiled spring being resiliently expanded in response to anterior movement of the upper end of the shank in gait for storing energy.

13. A prosthetic foot comprising:

a longitudinally extending foot keel having a forefoot portion at one end, a hindfoot portion at an opposite end and a midfoot portion extending between said forefoot and hindfoot portions;

an upstanding calf shank secured to the foot keel at a lower end of the calf shank which forms an ankle joint of the prosthetic foot and extending upward from the foot keel by way of an anterior facing convexly curved portion of the calf shank;

wherein the calf shank is secured to the foot keel by way of a coupling element, which is monolithically formed with the forefoot portion of the foot keel.

14. The prosthetic foot according to claim 13, wherein the coupling element extends posteriorly from the forefoot portion as a cantilever over the midfoot portion and part of the hindfoot portion of the foot keel.

15. The prosthetic foot according to claim 14 wherein the hindfoot portion and the midfoot portion of the foot keel are monolithically formed and connected to the monolithically formed forefoot portion and coupling element.

16. The prosthetic foot according to claim 13, wherein the lower end of the calf shank is reversely curved.

17. The prosthetic foot according to claim 16, wherein the coupling element houses the reversely curved lower end of the calf shank.

18. The prosthetic foot according to claim 16, wherein the reversely curved lower end of the calf shank is in the form of a spiral.

19. The prosthetic foot according to claim 18, wherein a radially inner end of the spiral of the calf shank is fastened to the coupling element.

20. The prosthetic foot according to claim 13, wherein the coupling element includes a stop to limit dorsiflexion of the calf shank.

21. The prosthetic foot according to claim 13, further comprising a cosmetic covering in the shape of a human foot and lower leg, the cosmetic covering being located over the foot keel and at least the lower end of the calf shank with the calf shank extending upward from the foot keel within the lower leg covering.

22. The prosthetic foot according to claim 13, further comprising a posterior calf device on the prosthetic foot to store energy during force loading of the prosthetic foot and return the stored energy during force unloading to increase the kinetic power generated for propulsive force by the prosthetic foot in gait.

23. The prosthetic foot according to claim 22, wherein the device includes at least one elongated member extending between the upper portion of the calf shank and a lower portion of the prosthetic foot, and at least one spring which is resiliently biased by the at least one elongated member in response to anterior movement of the upper end of the shank for storing energy.

24. The prosthetic foot according to claim 23, wherein the at least one spring includes a coiled spring with a free end connected to the elongated member, the coiled spring being resiliently expanded in response to anterior movement of the upper end of the shank in gait for storing energy.

25. A system for a lower extremity prosthesis comprising:
a longitudinally extending foot;
an ankle secured to the foot;
an upstanding shank extending upward from the ankle;
wherein the ankle and shank are formed by a resilient member having a reversely curved lower end secured to the foot to form the ankle and extending upward from the foot by way of an anterior facing convexly curved portion of the member, and wherein the resilient member is secured to the foot by way of a coupling element housing the reversely curved lower end of the member.

26. The system according to claim 25, wherein the reversely curved lower end of the resilient member is in the form of a spiral.

27. The system according to claim 26, wherein a radially inner end of the spiral of the resilient member is fastened to the coupling element.

28. The system according to claim 25, wherein the coupling element includes a stop to limit dorsiflexion of the resilient member.

29. The system according to claim 25, further comprising a cosmetic covering in the shape of a human foot and lower leg, the cosmetic covering being located over the foot, ankle and at least the lower end of the shank with the shank extending upward from the ankle within the lower leg covering.

30. The system according to claim 25, wherein the coupling element and foot are monolithically formed.

31. The system according to claim 25, wherein the coupling element forms an anterior facing concavity within which the reversely curved lower end of the member is housed.

32. The system according to claim 25, wherein the coupling element is connected at its posterior end to the foot.

33. The system according to claim 25, further comprising a posterior calf device on the prosthesis to store energy during force loading of the prosthesis and return the stored energy during force unloading to increase the kinetic power generated for propulsive force by the prosthesis in gait.

34. The system according to claim 33, wherein the device includes at least one elongated member extending between the upper portion of the shank and a lower portion of the prosthesis, and at least one spring which is resiliently biased by the at least one elongated member in response to anterior movement of the upper end of the shank for storing energy.

35. The system according to claim 34, wherein the at least one spring includes a coiled spring with a free end connected to the elongated member, the coiled spring being resiliently expanded in response to anterior movement of the upper end of the shank in gait for storing energy.

36. A prosthetic foot comprising:
a longitudinally extending foot keel;
an upstanding calf shank having a reversely curved lower end secured to the foot keel which forms an ankle joint of the prosthetic foot, the calf shank extending upward from the foot keel by way an anterior facing convexly curved portion of the calf shank;
wherein the calf shank is secured to the foot keel by way of a coupling element housing the reversely curved lower end of the calf shank.

37. The prosthetic foot according to claim 36, wherein the reversely curved lower end of the calf shank is in the form of a spiral.

38. The prosthetic foot according to claim 37, wherein a radially inner end of the spiral of the calf shank is fastened to the coupling element.

39. The prosthetic foot according to claim 36, wherein the coupling element includes a stop to limit dorsiflexion of the calf shank.

40. The prosthetic foot according to claim 36, further comprising a cosmetic covering in the shape of a human foot and lower leg, the cosmetic covering being located over the foot keel and at least the lower end of the calf shank with the shank extending upward from the foot keel within the lower leg covering.

41. The prosthetic foot according to claim 36, wherein the coupling element and foot keel are monolithically formed.

42. The prosthetic foot according to claim 36, wherein the coupling element forms an anterior facing concavity within which the reversely curved lower end of the calf shank is housed.

43. The prosthetic foot according to claim 36, wherein the coupling element is connected at its posterior end to the foot keel.

44. The prosthetic foot according to claim 36, further comprising a posterior calf device on the prosthetic foot to store energy during force loading of the prosthetic foot and return the stored energy during force unloading to increase the kinetic power generated for propulsive force by the prosthetic foot in gait.

45. The prosthetic foot according to claim 44, wherein the device includes at least one elongated member extending between the upper portion of the calf shank and a lower portion of the prosthetic foot, and at least one spring which is resiliently biased by the at least one elongated member in response to anterior movement of the upper end of the shank for storing energy.

46. The prosthetic foot according to claim 45, wherein the at least one spring includes a coiled spring with a free end connected to the elongated member, the coiled spring being resiliently expanded in response to anterior movement of the upper end of the shank in gait for storing energy.